

REMARKS

In the amendment dated August 16, 2004, the Applicant amended the independent Claims 1 and 3 to incorporate the limitations of Claim 12, which was indicated as containing allowable subject matter. Upon further consideration the Applicant considers that independent Claims 1 and 3 also contain allowable subject matter without the limitations of Claim 12. The present amendment is made to place the claims in their previous condition. New Claim 21 corresponds exactly to the previous and cancelled Claim 12.

In the Office Action dated April 20, 2004, Claims 1-7, 9, 13-15, 18 and 19 were rejected under 35 U.S.C. § 103(a) over Pirotte (US 4,147,927) in view of Heat Exchanger Design (page no. 30, 347, 352). The Applicant respectfully disagrees with this rejection.

Pirotte discloses the basic concept of the electric heating arrangement. Pirotte does not disclose that the legs of the heat dissipators taper toward their free ends, or that the base portion is thicker than the legs projecting therefrom. The rejection states that this feature would be obvious in view of the "Heat Exchanger Design" reference. The "Heat Exchanger Design" reference does not refer to electric heating devices of the type to which the present invention refers. A heat exchanger is a device in which heat inside of a tubular member is transferred to a fluid flowing along the outside of the tubular member or vice versa. To increase the heat transfer surface the tubular member is provided on its outside with heat dissipators in the form of fins both surfaces of which are in contact with the flowing fluid. For such a specific use of fins the "Heat Exchanger Design" reference discloses that tapered fins make more efficient use of the fin material than fins of uniform thickness, but at the same time the "Heat Exchanger Design" reference discloses that tapered fins are rarely used except where they can be fabricated by casting.

In contrast to this, in the present invention the heat dissipators are not used, and cannot be used, in a flowing fluid outside a tubular member to transfer heat from the tubular member to the flowing fluid, but the heat dissipators are provided inside of the tubular member and transfer the heat from F'TCs to the shell of the tubular member. Now, since the heat dissipators are not used to

transfer heat to a flowing fluid but to a solid shell, a person skilled in the art who intends to improve the heat transfer to a solid shell would not expect to receive some positive advice in the field of fins operating in a fluid flowing outside of a heating device if the skilled person seeks an improvement of the internal structure of the heating device. The internal structure needs efficient heat transfer by means of heat conduction through solid bodies, but not through heat convection through liquids. In view of the completely different heat transfer mechanisms and in view of the fact that in a heating device according to the present invention a flowing fluid is not used and cannot be used as a heat transfer medium, a person skilled in the art would not look for a positive advice by looking at the field of heat exchangers in which the heat transfer is exclusively effected to a flowing medium like air or water.

To combine select and unrelated features of the "Heat Exchanger Design" reference with Pirotte is simply a matter of impermissible hindsight. The references themselves must show some teaching or suggestion, to combine the features of a heat exchanger with those of the electric heating arrangement of Pirotte. This teaching or suggestion is not present within the references. Therefore, the Applicant considers this rejection overcome.

Applicant respectfully submits that this application should now be in better condition for allowance and respectfully requests favorable consideration.

Respectfully submitted,



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Date

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